Information Science and Technology Center Seminar

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"Markov Logic Networks: A Language for Statistical Relational Learning"

Wednesday, September 22, 2010
3:00 - 4:00 PM
TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: Modern machine learning applications are characterized by high degrees of complexity and uncertainty. Complexity is well handled by first-order logic, and uncertainty by probabilistic graphical models. Statistical relational learning seeks to combine the two. Markov logic networks (MLNs) do this by attaching weights to logical formulas and treating them as templates for features of Markov random fields. This talk will cover MLN representation, inference, learning and applications. MLN inference techniques are based on satisfiability testing, resolution, Markov chain Monte Carlo, and belief propagation. Learning techniques include pseudo-likelihood, voted perceptrons, second-order convex optimization, and inductive logic programming. MLNs have been applied in a wide variety of areas, including natural language processing, information extraction and integration, robot mapping, social networks, computational biology, and others. Open-source implementations of MLN algorithms are available in the Alchemy package (alchemy.cs. washington.edu).

(Joint work with Jesse Davis, Stanley Kok, Daniel Lowd, Aniruddh Nath, Hoifung Poon, Matt Richardson, Parag Singla, Marc Sumner, and Jue Wang.)

Biography: Domingos received an undergraduate degree (1988) and M.S. in Electrical Engineering and Computer Science (1992) from IST, in Lisbon. He received an M.S. (1994) and Ph.D. (1997) in Information and Computer Science from the University of California at Irvine. Domingos spent two years as an assistant professor at IST, before joining the faculty of the University of Washington in 1999. He is the author or co-author of over 150 technical publications in machine learning, data mining, and other areas. He is a member of the editorial board of the Machine Learning journal, co-founder of the International Machine Learning Society, and past associate editor of JAIR. He was program co-chair of KDD-2003 and SRL-2009, and has served on the program committees of AAAI, ICML, IJCAI, KDD, SIGMOD, WWW, and others. Domingos is a AAAI Fellow, and has received a Sloan Fellowship, an NSF CAREER Award, a Fulbright Scholarship, an IBM Faculty Award, several best paper awards, and other distinctions.

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